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PROTEINS WITH INCREASED LEVELS OF ESSENTIAL AMINO ACIDS

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5 **CROSS-REFERENCE TO RELATED APPLICATIONS:**

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This application claims priority from and is a continuation-in-part of pending U.S. Patent Application No. 08/740,682 filed Nov. 1, 1996^{now abandoned}. This application also claims priority from and is a continuation-in-part of U.S. Patent Application No. 09/297,418 filed April 30, 1999^{now abandoned}, which claims priority from PCT/US97/20441, filed October 31, 1997.

10 U.S. Patent Application No. 08/740,682, U.S. Patent Application No. 09/297,418 and PCT/US97/20441 are incorporated by reference herewithin.

Field of the Invention

15 The present invention relates to the field of protein engineering wherein changing amino acid compositions effects improvements in the nutrition content of feed and food. Specifically, the present invention relates to methods of enhancing the nutritional content of animal feed by expressing derivatives of
20 protease inhibitor to provide higher percentages of essential amino acids in plants.

Background of the Invention

25 Feed formulations are required to provide animals essential nutrients critical to growth. However, crop plants are generally rendered food sources of poor nutritional quality because they contain low proportions of several amino acids which are essential for, but cannot be synthesized by, monogastric animals.

For many years researchers have attempted to improve the balance of essential amino acids in the seed proteins of important crops through breeding
30 programs. As more becomes known about seed storage proteins and the expression of the genes which encode these proteins, and as transformation systems are developed for a greater variety of plants, molecular approaches for